REMARKS/ARGUMENTS

This amendment is presented in response to the Office Action mailed on January 12, 2005 for the purpose of placing the application for reconsideration and allowance. Claims 1, 4, 6 and 9 are active in the application.

Applicants have made minor changes to the substitute specification filed in response to the Office Action mailed on April 6, 2004 for the purpose of updating the status of a related patent application that has issued into a patent and for the purpose of correcting typographical errors. In response to the objection to claim 1, Applicants have amended claim 1 to correct the redundancy noted by the Examiner and for the purpose of placing the claim in better form.

Claim Rejection - 35 U.S.C. § 103

Applicants submit that it is impermissible within the framework of section 103 to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill (see 147 USPQ at 393). Applicants traverse the Examiner's rejection of claims 1, 4, 6, and 9 under 35 U.S.C. 103(a) as being unpatentable over Housel, III et al, U.S. Patent 5,907,678, hereinafter referred to as "Housel", in view of Chafle et al, U.S. Patent Application Publication 2002/0152271, hereinafter referred to as "Chafle".

The basis of the rejection is that referring to claim 1, Housel teaches a method of checkpointing and restarting for a plurality of computer systems but is silent on whether the computer system is a heterogeneous system and that Chafle teaches a rollback system for a client/server environment that is heterogeneous. According to the Examiner, it would be obvious to one of ordinary skill in the art to combine the rollback system of Housel with the heterogeneous system of Chafle because a large part of environments will be heterogeneous in the near future.

First, Applicants will address the teachings of Housel cited by the Examiner. Applicants have reviewed the Housel patent and find that it is directed to low speed communications between a host application (server) and a terminal or terminal emulator (client) using a structured protocol such as a Telnet protocol or a "terminal emulation protocol". Housel defines "terminal emulation protocol as a protocol used for

communications between two applications or devices which includes structured and segmentable groupings of data and further includes some amount of recurring data being communicated between the applications. The Telenet protocol typically comprises a series of control characters followed by displayable characters with each sequential grouping of displayable characters being associated in some manner with the preceding block of control characters.

One of the objectives of Housel is to reduce the volume of data for transfer on startup. Housel uses persistent cache synchronization and a protocol cache for communications between the client and server having multiple concurrent communications sessions. All sessions share a common checkpoint cache which allows restart of a session regardless of which of the concurrent sessions is being restarted (i.e. provides a "hot" restart). That is, sessions may be intentionally discontinued and restarted later. Problems may also be encountered where random session failures occur, causing unplanned loss of connection to the host. Housel also uses differencing to reduce the amount of information which must be transferred over the communication link.

Relative to claim 1, the Examiner cites a number of portions of the summary of invention section of the patent. More specifically, the Examiner cites column 2, lines 30-60, column 4, lines 42-43, column 2, lines 34-36, column 2, line 61-column 3, line 15, column 3, lines 16-18, column 3, lines 25-27 and column 4, lines 17-41. The cited material in column 2 describes persistent synchronization between two applications, providing a checkpoint cache for multiple concurrent sessions which gradually obtains information reflecting traffic for all of the concurrently active sessions for providing a "hot" start up and maintaining a separate active protocol cache between a single client/server pair.

Additionally, the cited portions of columns 2 and 3 describe a method of persistent cache synchronization for multiple concurrent sessions that utilizes first, second, third and fourth caches respectively operatively associated with the first session at the first computer, the first session at the second computer, the second session at the first computer and the second session at the second computer. The first computer transmits a **checkpoint request** to the second computer indicating one of the first or third caches to be used to provide **a checkpoint**. The second computer responds to the request

by copying the second or fourth cache as indicated by the checkpoint request. The second computer sends a checkpoint confirmation message as a result of copying a cache to the checkpoint cache of the second computer. In response to the checkpoint confirmation message, the first computer creates a checkpoint cache of the first computer as a copy of the indicated one of the first or third cache.

The cited material in column 4 describes another embodiment of the Housel invention which initiates a third communication session by transmitting a request from the client application to the server application over the external communications link. In response to the request, an identification of the checkpoint cache of the second computer is transmitted to the client application. The client application selects a checkpoint cache of the first computer associated with the transmitted identification as a protocol cache operatively associated with the third session at the first computer. An acknowledgment message is then transmitted to the server application acknowledging selection of the identified checkpoint cache as the protocol cache for use with the third session at the first computer. In response to the acknowledgment message, the identified checkpoint cache of the second computer is selected as a corresponding checkpoint cache operatively associated with the third session at the second computer. This provides for utilization of the checkpoint cache created from either or both first and second sessions for start up of a third session which may be a restart of either the first or the second session. The establishment of a checkpoint is not to create a rollback point relative to a data file as in the case of the preferred embodiment of the present invention. In Housel, the checkpoint is established for allowing restart of applications as discussed herein. In another embodiment of Housel, a plurality of checkpoint caches is associated with the second computer and the identifications of each of the checkpoint caches is provided and one, preferably the most recent one, is selected for use in start up.

The Examiner also cites column 7 lines 52-53. This material indicates that the protocol cache 38 of the first computer and the protocol cache 44 of the second computer may be implemented with mass storage such as hard disk.

From the above, it is seen that Housel discloses the use of protocol caches at the server/client computers. These caches are associated with sessions through the use of checkpoints for the purpose of providing "hot" start ups. A checkpoint cache is used to

initialize an active protocol cache for a communication session as described relative to Figure 9.

Applicants find that Housel does not checkpoint the first program and then sends a checkpoint request to the second computer as stated by the Examiner. As described above, the first program sends a checkpoint request to the second computer to provide a checkpoint. After copying the second or fourth cache, the second computer sends a confirmation message (indicating that the checkpoint cache was provided without error) to which the first computer responds by creating a checkpoint cache. Further, the sequence of operations is used to associate the checkpoint cache of the second computer with both the first and second session.

Applicants find Housel absent any suggestion of transmitting a rollback request as stated by the Examiner. In accordance with Applicants teachings, the purpose of the rollback is to reset the contents of a data file being maintained by the second program to be consistent with the state of the first program established at the most recent checkpoint. The acknowledgment message in Housel as discussed above pertains to the selection of the identified checkpoint cache as the protocol cache for use in a third session which may be a new or restart of the first or second session.

It will be noted that a restart or reboot operation differs markedly from a rollback operation. Consider the standard personal computer which provides a "soft" boot to take place by either selecting "restart" from the normal shutdown menu or by the simultaneous selection of the keyboard keys ALT-CTRL-DELETE. The same personal computer also provides a facility for establishing restore points (e.g. checkpoints) automatically created by the operating system (e.g. XP) or manually created by a user which can be later invoked manually by the user through the operating system via a System Restore function. The user selects System Restore and then clicks on Restore my computer to an earlier time.Next (e.g. rollback) and follows the instructions. It is seen that these personal computer operations are treated as being separate and distinctive operations. For the same reasons, these same operations are regarded as separate operations in other types of computers. It will also be noted that Applicants specification also distinguishes restart and rollback operations which are separately described. Claim 1

is specifically directed to rollback operations which can be performed in a heterogeneous computer environment.

Accordingly, Applicants find Housel absent any discussion in the cited material pertaining to transmitting checkpoint status information from the second to the first information. The material in column 4 cited by the Examiner pertains to the transmission of an acknowledgment message which indicates selection of an identified checkpoint cache. Again, these operations take place for the purpose of associating protocol caches of the client/server pair with specific sessions since the protocol information can be used to provide a "hot" restart. Applicants find Housel to disclose a completely different mode of operation which is designed to facilitate restart/start operations in contrast to rollback operations. For these reasons alone, claim 1 should be deemed to distinguish patentably over the teachings of Housel.

While Housel discloses a client and server system, it is clear that the client and server system is a specific type of system which involves the use of terminals/ terminal emulator applications and a host application for the purpose of taking advantage of the installed user base of terminal emulator applications and terminals (see column 2, lines 3-7). The Housel system uses a particular type of terminal protocol such as Telnet 3270 as described above. It is well known in the art that emulators are used in communications as a means of making one computer or terminal seem to be the type that the other computer expects to encounter. A terminal emulator, for example, is defined as a program that enables a microcomputer to pretend to be a mainframe terminal by using the procedures and codes expected by the mainframe (see Microsoft Computer Dictionary 2nd edition). This arrangement should be clearly deemed a non-heterogeneous system. Applicants submit that to try to transform this system into one that is heterogeneous would be contrary to the basic teachings of Housel. Accordingly, Applicants submit that a skilled artisan would not be motivated to attempt to combine the teachings of Housel with the teachings of Chafle.

It should also be noted that Chafle while disclosing a peer to peer system that uses a rollback-based method and checkpoints teaches a method of carrying out serverless real-time collaboration without relying on a centralized or distributed server as a back-end (see paragraph 9). This is accomplished by providing a useful protocol by

which front-end clients alone can carry out such real-time collaboration. Thus, according to Chafle, the protocol relies solely on peer-to-peer communication, wherein the peers are the clients of a collaboration session (see paragraph 75).

Client modifications are serialized and time stamped then broadcasted to the other clients. A client can avoid rollback by selecting the next to go timestamps or by being quiet. Checkpoints are created through the use of artificial modifications broadcasted to all clients. Upon serialization and processing of an artificial modification, each client advances its previous checkpoint to the workspace state contained in the artificial modification. In Chafle, a client can carry out a rollback to checkpoint by sending an artificial modification for the purpose whose processing upon serialization requires the following—all clients roll back to the last checkpoint they have created and throw away all modifications after the checkpoint. This ensures that all clients restart collaboration from the last checkpoint onwards. This system requires that each client machine clock will remain synchronized to within a few tens of milliseconds of each other.

From the above, it is seen that Chafle does not disclose the use of a client/server environment as stated by the Examiner. Accordingly, this fact in addition to the completely different mode of operation utilized in Chafle would discourage a skilled artisan from attempting to combine the teachings of Chafle and Housel. Therefore, Applicants submit that claim 1 should be deemed patentable over the cited teachings of Housel and Chafle.

For similar reasons to that given relative to claim 1, claim 4 distinguishes patentably over the teachings of Housel and Chafle. The cited material in column 3 of Housel describes the use of separate caches which are copied in accordance with the checkpoint request. Clearly, this indicates the use of different storage contents rather than the same contents as suggested by the Examiner. Further, as discussed, the contents pertain to protocol information described above since the contents of the protocol caches are copied to produce checkpoint caches. Accordingly, Applicants submit that claim 4 should be deemed patentable over the cited teachings of Housel and Chafle.

For reasons similar to those given relative to claim 1, claim 6 distinguishes patentably over the cited teachings of Housel and Chafle. Many of the same portions of Housel cited relative to claim 1 were also cited relative to claim 6. Since they were

distinguished relative to claim 1, they will not be repeated. Additionally, the Examiner cites column 2, line 39 and column 9, lines 17-19. The portion of column 2 is cited to support the Examiner's statement that Housel discloses the system as being composed of a client and a server, which is interpreted as being a heterogeneous computer system. The cited material to follow indicated in bold merely states that a checkpoint cache is provided for multiple concurrent sessions between a single client/server pair which overcomes the problem of a lack of a unique identifier which can be associated with the checkpoint cache. Applicants find no discussion or suggestion of a heterogeneous computer system. The fact that a system contains a client and server application does not mean that the system is heterogeneous. For the reasons discussed above, Housel discloses a non-heterogeneous system that provides communications between a host application and terminals. Further, the Examiner cited Chafle for applying its teachings regarding a heterogeneous system to the teachings of Housel which the Examiner indicated were silent on whether the computer system is a heterogeneous system. For all of these reasons, Applicants submit that they do not find any basis for the Examiner's conclusion that Housel is a heterogeneous computer system.

Claim 6 is directed to transmitting a checkpoint request to a third program executing in a third computer over a second session and the checkpointing of that third program resulting in the writing of a fifth set of checkpoint status information followed by the transmission of a third checkpoint response to the first program. The Examiner cites lines 17-19 of column 9 in support of Housel disclosure of such an arrangement. The cited material only states that the benefits and advantages of the present invention may also be achieved with multiple terminal emulator applications 36 associated with multiple host applications 42 across various sessions separated in time. This material is followed by stating that the methods, apparatus and program products of the present invention may be applied to a plurality of communications over a plurality of sessions.

It seems clear from the above that Housel still is envisioning the system of Figure 1 which includes first and second computers that run the terminal emulator application 36 and host application 42 respectively. Housel is suggesting in the system of Figure 1, the terminal application 36 may also represent multiple terminal applications and host application 42 may also represent multiple host applications. The fact that the sessions

are stated to be separated in time supports Applicants view that the system of Figure 1 in Housel will still only contain first and second computers. To deem otherwise would be contrary to Housel and also require speculation as to the particular configuration to be used to achieve this result. Also, Housel describes communications over a plurality of sessions implemented with the system of Figure 1. Further, there is no showing or suggestion of the steps of claim 6 relative to a third program in either Housel or Chafle. Accordingly, Applicants submit that claim 6 should be deemed patentable over the cited teachings of Housel and Chafle.

For reasons similar to those given relative to claim 1, claim 9 should also be deemed to distinguish patentably over the teachings of Housel and Chafle. Claim 9 is directed to opening a plurality of sessions between the first program and second program for accessing a corresponding plurality of files by the second program and that the checkpointing step C of claim 1 flushes all of the plurality of files and includes checkpoint information for all of the plurality of files in the second set of checkpoint information. The Examiner cites column 2, lines 30-35 and column 16, lines 25-30. The material of column 2 describes having persistent synchronization for a first communication session and a concurrent second communication session over an external communication link between an application executing on a first computer and an application executing on a remotely located second computer. Applicants find this material absent any discussion pertaining to opening a plurality of sessions for accessing of a plurality of files let alone the arrangement set forth in claim 9.

The cited material in column 16 describes that the protocol and checkpoint caches, each include an index file and a data file (i.e. directory/data sections, characteristic of all caches). Also, the cited material states that the protocol cache 44 (second system) is copied to a temporary file and for memory utilization, the active cache files may be flushed to a disk (e.g. written back to disk) and the new checkpoint cache created by copying the active files to new checkpoint files. Earlier in column 16, Housel discusses that a maximum number of checkpoint slots may be allocated at the second computer and in this case the checkpoint slots are reused, preferably so that the oldest checkpoints are deleted as new checkpoints are created.

Housel makes it clear that the procedure for removing checkpoints is to delete the oldest checkpoint. The flushing described in Housel pertains to a standard technique used for memory utilization involving writing back active files to disk. Applicants find no suggestion in Housel of flushing (eliminating) all of the plurality of files let alone the method of claim 9 directed to flushing files during checkpointing as set forth in step C. accessed by a second program during a plurality of sessions opened between a first and second program. For these differences, Applicants submit that claim 9 should be deemed patentable over the cited teachings of Housel and Chafle.

In view of the above arguments and clarifying amendments, Applicants submit that claims 1, 4, 6, and 9 should be deemed patentable over the cited prior art. A notice to this effect is respectfully solicited.

Applicants ask the Examiner to contact Applicants attorney to discuss any other grounds for rejecting Applicants claims before acting on this amendment.

Also, if any questions or issues should arise with respect to this amendment or the allowability of this application, the Examiner is **urged** to **call Applicants' attorney at the number indicated herein**. Further, if the Examiner feels that a discussion will further advance the prosecution of this application, the Examiner is also **urged** to call as suggested herein.

Respectfully submitted,

Faith F. Driscoll

Faith F. Driscoll
Registration No. 24,206
Attorney for Applicants
(781) 326-6645

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